

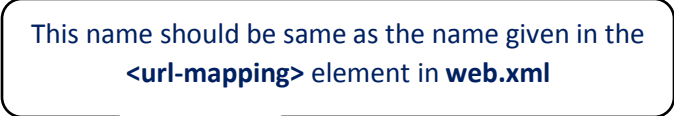
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## Steps to create a simple web application using servlets

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**Step 1:** create a HTML page containing a **<form>** element.

```
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Factorial</title>
</head>
<body>
  <form action="factorial" method="post">
    <table>
      <tr>
        <td>Enter a number:</td>
        <td><input type="text" name="fact"></td>
      </tr>
      <tr>
        <td colspan="2"><input type="submit" value="find"/></td>
      </tr>
    </table>
  </form>
</body>
</html>
```



This name should be same as the name given in the **<url-mapping>** element in **web.xml**

**Step 2:** create a new servlet and override the **doPost()** or **doGet()** method based on the value of the **method** attribute given in the HTML page's **<form>** element.

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;

import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class FactorialServlet extends HttpServlet {

  protected void doPost(HttpServletRequest request, HttpServletResponse
    response) throws ServletException, IOException {

  }

}
```

**Step 3:** Use the **request** object to read the parameters sent from the HTML file.

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class FactorialServlet extends HttpServlet {

    protected void doPost(HttpServletRequest request, HttpServletResponse
    response)throws ServletException, IOException {

        long number = Integer.parseInt(request.getParameter("fact"));
    }

}
```

**Step 4:** Use the **response** object to set the **content-type** as **text/html** and get the **PrintWriter** object.

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class FactorialServlet extends HttpServlet {

    protected void doPost(HttpServletRequest request, HttpServletResponse
    response) throws ServletException, IOException {
        long number = Integer.parseInt(request.getParameter("fact"));

        response.setContentType("text/html");
        PrintWriter out = response.getWriter();
    }

}
```

**Step 5:** **Process the data** based on the service to be provided. ex: validating the username and password, calculating the factorial etc.,

```

package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class FactorialServlet extends HttpServlet {

    public long calcFactorial(long number) {
        if (number == 1 || number == 0) {
            return 1;
        } else {
            return number * calcFactorial(number - 1);
        }
    }

    protected void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
        long number = Integer.parseInt(request.getParameter("fact"));

        response.setContentType("text/html");
        PrintWriter out = response.getWriter();

    }

}

```

**Step 6:** Use the **PrintWriter** object **out** to print the response in HTML format.

```

package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class FactorialServlet extends HttpServlet {

    public long calcFactorial(long number) {
        if (number == 1 || number == 0) {
            return 1;
        } else {
            return number * calcFactorial(number - 1);
        }
    }

}

```

```
protected void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
    long number = Integer.parseInt(request.getParameter("fact"));

    response.setContentType("text/html");
    PrintWriter out = response.getWriter();

    out.println("Factorial of "+number+" is:<b>" +calcFactorial(number)+
"</b>");

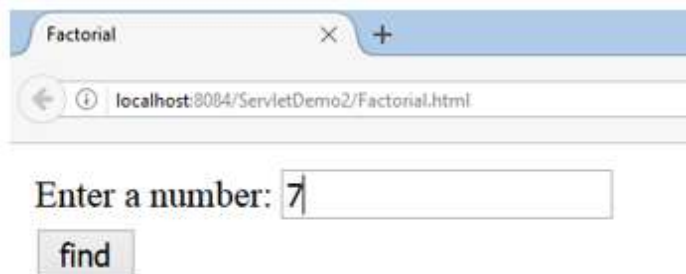
}

}
```


**Step 7:** Add the *servlet* and *servlet mapping* to the deployment descriptor *web.xml*.

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app>
    <servlet>
        <servlet-name>fact</servlet-name>
        <servlet-class>com.wipro.servlet.FactorialServlet</servlet-class>
    </servlet>
    <servlet-mapping>
        <servlet-name>fact</servlet-name>
        <url-pattern>/factorial</url-pattern>
    </servlet-mapping>
</web-app>
```

Provide this name in the **action** attribute of the <form> element in the HTML page without '/'



A screenshot of a web browser window with the title 'Factorial'. The address bar shows 'localhost:8084/ServletDemo2/Factorial.html'. The page content includes a text input field with the number '7' entered, preceded by the text 'Enter a number:'. Below the input field is a button labeled 'find'.



A screenshot of a web browser window with the title 'http://localhost:8084/ServletDemo2/factorial'. The address bar shows 'localhost:8084/ServletDemo2/factorial'. The page content displays the text 'Factorial of 7 is:5040'.

---

## Steps to create a web application using servlets for Form Processing

---

**Step 1:** create a HTML page containing a **<form>** element.

```
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Login</title>
</head>
<body>
    <FORM NAME="login" ACTION="MyServlet" METHOD="POST">
        <table>
            <tr>
                <td>Enter username :</td>
                <td><input type="text" name="username"/></td>
            </tr>
            <tr>
                <td>Enter Password :</td>
                <td><input type="password" name="pass"/></td>
            </tr>
            <tr>
                <td><input type="submit" value="Submit" /></td>
                <td><input type="reset" value="Clear" /></td>
            </tr>
        </table>
    </FORM>
</body>
</html>
```

**Step 2:** create a new servlet and override the **doPost()** or **doGet()** method based on the value of the **method** attribute given in the HTML page's **<form>** element.

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
public class MyServlet extends HttpServlet {
    protected void doPost(HttpServletRequest request, HttpServletResponse
        response) throws ServletException, IOException {
    }
}
```

**Step 3:** Use the *request* object to read the parameters sent from the HTML file.

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class MyServlet extends HttpServlet {

    protected void doPost(HttpServletRequest request, HttpServletResponse
                           response) throws ServletException, IOException {

        String uname = request.getParameter("username");
        String passwd = request.getParameter("pass");

    }
```

**Step 4:** Use the *response* object to set the *content-type* as *text/html* and get the *PrintWriter* object.

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class MyServlet extends HttpServlet {

    protected void doPost(HttpServletRequest request, HttpServletResponse
                           response) throws ServletException, IOException {

        String uname = request.getParameter("username");
        String passwd = request.getParameter("pass");

        response.setContentType("text/html");
        PrintWriter out = response.getWriter();

    }
```

**Step 5:** *Process the data* based on the service to be provided. ex: validating the username and password, calculating the factorial etc.,

**Step 6:** Use the *PrintWriter* object *out* to print the response in HTML format.

```
package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class MyServlet extends HttpServlet {

    protected void doPost(HttpServletRequest request, HttpServletResponse
        response) throws ServletException, IOException {

        String uname = request.getParameter("username");
        String passwd = request.getParameter("pass");

        response.setContentType("text/html");
        PrintWriter out = response.getWriter();

        if (uname.equals("john") && passwd.equals("apple")) {
            out.print("<html>");
            out.print("<head></head>");
            out.print("<body>");
            out.print("Welcome,"+uname);
            out.print("</body>");
            out.print("</html>");
        } else {
            response.sendRedirect("Login.html");
        }

    }
}
```

**Step 7:** Add the *servlet* and *servlet mapping* to the deployment descriptor *web.xml*.

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app>
    <servlet>
        <servlet-name>login</servlet-name>
        <servlet-class>com.wipro.servlet.MyServlet</servlet-class>
    </servlet>
    <servlet-mapping>
        <servlet-name>login</servlet-name>
        <url-pattern>/MyServlet</url-pattern>
    </servlet-mapping>
</web-app>
```




---

## Steps to create a web application using servlets for Database Connectivity

---

**Step 1:** create a HTML page containing a `<form>` element.

```
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>User Details</title>
</head>
<body>
  <form name="registerForm" action="user" method="post">
    <table>
      <tr>
        <td>UserName</td>
        <td><input type="text" name="username" /></td>
      </tr>
      <tr>
        <td>Password</td>
        <td><input type="password" name="password" /></td>
      </tr>
      <tr>
        <td>Email</td>
        <td><input type="email" name="email" /></td>
      </tr>
      <tr>
        <td>PhoneNumber</td>
        <td><input type="text" name="phone" /></td>
      </tr>
      <tr>
        <td><input type="submit" name="option" value="Register" />
        <input type="submit" name="option" value="Update" /></td>
        <td><input type="submit" name="option" value="Delete" />
        <input type="submit" name="option" value="Show" />
      </td>
      </tr>
    </table>
  </form>
</body>
</html>
```



```

        </tr>
    </table>
</form>
</body>
</html>

```

**Step 2:** create the two HTML pages *Success.html* and *Error.html*.

### Success.html

```

<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Success</title>
</head>
<body>
<h1>Operation completed successfully!</h1>
</body>
</html>

```

### Error.html

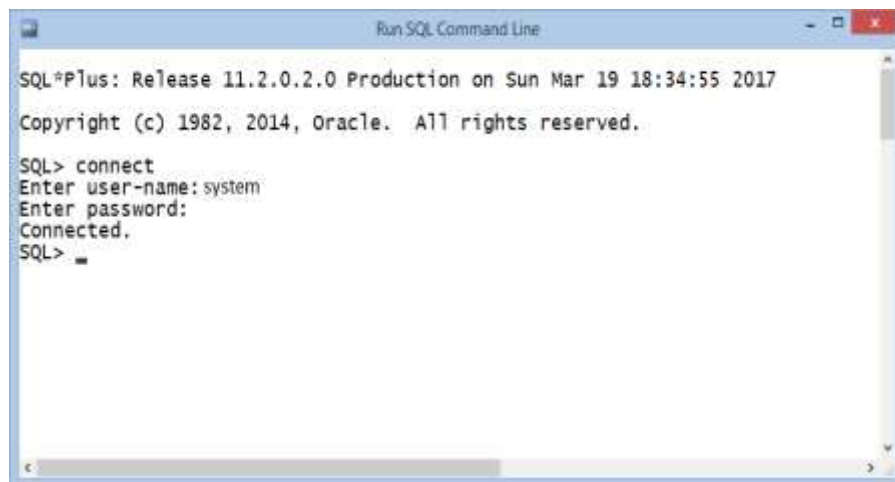
```

<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Error</title>
</head>
<body>
<h1>Error Occured</h1>
</body>
</html>

```

**Step 3:** create the **table** in the database by using *sqlplus* (in case of Oracle).

- a.** Go to run (windows Key + R) and type *sqlplus*.
- b.** Type **connect**. You will be prompted for username. Type **system** as the username and password as **admin**.



c. Type the **SQL query** to create the table.



```
SQL> create table userdetails(  
2  username varchar2(20),  
3  password varchar2(20),  
4  email varchar2(20),  
5  phone number(10)  
6  );  
  
Table created.  
  
SQL> _
```

**Step 4:** create a class **DBUtil** that creates a database connection and returns it.

```
package com.wipro.util;  
  
import java.sql.Connection;  
import java.sql.DriverManager;  
import java.sql.SQLException;  
  
public class DBUtil {  
  
    private static Connection con;  
  
    public static Connection getConnection() {  
        try {  
            if (con == null)  
            {  
                Class.forName("oracle.jdbc.driver.OracleDriver");  
                con =  
                DriverManager.getConnection("jdbc:oracle:thin:@localhost:1521:xe",  
                "admin", "admin");  
            }  
        } catch (Exception e) {  
            System.out.println(e);  
        }  
        return con;  
    }  
}
```

**Step 5:** create a new servlet and override the **doPost()** or **doGet()** method based on the value of the **method** attribute given in the HTML page's <form> element.

```

package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
public class UserServlet extends HttpServlet {

protected void doPost(HttpServletRequest request, HttpServletResponse
                    response) throws ServletException, IOException {
}

```

**Step 6:** Use the *request* object to read the parameters sent from the HTML file.

```

package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class UserServlet extends HttpServlet {

protected void doPost(HttpServletRequest request, HttpServletResponse
                    response) throws ServletException, IOException {

//Retrieving all the parameters from the form
String username = request.getParameter("username");
String password = request.getParameter("password");
String email = request.getParameter("email");
long phone = Long.parseLong(request.getParameter("phone"));
String option = request.getParameter("option");
}
}

```

**Step 7:** Create reference for the *Connection*, *Statement* and *ResultSet* interfaces required for JDBC.

```

package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import java.sql.Connection;
import java.sql.ResultSet;
import java.sql.Statement;

```

```

import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class UserServlet extends HttpServlet {

    Connection con;
    Statement st;
    ResultSet rs;

    protected void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {

        //Retrieving all the parameters from the form
        String username = request.getParameter("username");
        String password = request.getParameter("password");
        String email = request.getParameter("email");
        long phone = Long.parseLong(request.getParameter("phone"));
        String option = request.getParameter("option");
    }
}

```

**Step 8:** Use the *response* object to set the *content-type* as *text/html* and get the *PrintWriter* object.

```

package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import java.sql.Connection;
import java.sql.ResultSet;
import java.sql.Statement;

import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class UserServlet extends HttpServlet {

    Connection con;
    Statement st;
    ResultSet rs;

    protected void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {

        //Retrieving all the parameters from the form
        String username = request.getParameter("username");

```

```

String password = request.getParameter("password");
String email = request.getParameter("email");
long phone = Long.parseLong(request.getParameter("phone"));
String option = request.getParameter("option");

response.setContentType("text/html");
PrintWriter out = response.getWriter();

}
}

```

**Step 9:** Use the connection reference **con** to get the connection from the **getConnection()** method of the **DBUtil** class and create the statement to perform various DB operations such as Insert, Update, Delete, Select etc..

a. Use the **response** object to redirect the output to **Success.html** if the operation is successful else redirect it to **Error.html**.

```

package com.wipro.servlet;

import java.io.IOException;
import java.io.PrintWriter;
import java.sql.Connection;
import java.sql.ResultSet;
import java.sql.Statement;

import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class UserServlet extends HttpServlet {

    Connection con;
    Statement st;
    ResultSet rs;

    protected void doPost(HttpServletRequest request, HttpServletResponse
    response) throws ServletException, IOException {

        //Retrieving all the parameters from the form
        String username = request.getParameter("username");
        String password = request.getParameter("password");
        String email = request.getParameter("email");
        long phone = Long.parseLong(request.getParameter("phone"));
        String option = request.getParameter("option");

        response.setContentType("text/html");
        PrintWriter out = response.getWriter();

        try {

```

```

        //Get the connection
        con = DBUtil.getConnection();
        //Create the statement
        st = con.createStatement();
//Insert operation
        if (option.equals("Register")) {

st.executeUpdate("insert into userdetails values('" + username + "', '"
+ password + "', '" + email + "', '" + phone + "')");
            response.sendRedirect("Success.html");

        }

//Update operation
        if (option.equals("Update")) {

st.executeUpdate("update userdetails set password='" + password + "',
email='" + email + "',phone='" + phone + " where username='" + username
+ "'");
            response.sendRedirect("Success.html");

        }

//Delete operation
        if (option.equals("Delete")) {

st.executeUpdate("delete from userdetails where username='" + username
+ "'");
            response.sendRedirect("Success.html");

        }

//Select Operation
        if (option.equals("Show")) {

            rs = st.executeQuery("select * from userdetails");

            if (rs != null) {

                out.println("<table border='1'>");
out.println("<th>Name</th><th>Password</th><th>Email</th><th>Phone
No.</th>");
while (rs.next()) {
                out.println("<tr><td>" + rs.getString(1) + "</td><td>" +
rs.getString(2) + "</td><td>" + rs.getString(3) + "</td><td>" +
rs.getLong(4) + "</td></tr>");
            }

            out.print("</table>");
        }
    } catch (Exception e) {

```

```

        response.sendRedirect("Error.html");
    }

}

}

```

**Step 10:** Add the *servlet* and *servlet mapping* to the deployment descriptor *web.xml*.

```

<?xml version="1.0" encoding="UTF-8"?>
<web-app>
    <servlet>
        <servlet-name>user</servlet-name>
        <servlet-class>com.wipro.servlet.UserServlet</servlet-class>
    </servlet>
    <servlet-mapping>
        <servlet-name>user</servlet-name>
        <url-pattern>/user</url-pattern>
    </servlet-mapping>
</web-app>

```

#### Insert operation

User Details

localhost:8084/ServletDBDemo/

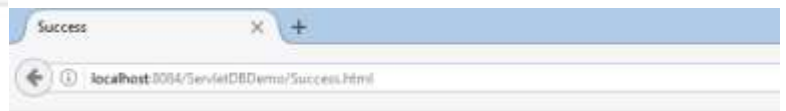
UserName: Kumar

Password: •••••

Email: kumar@gmail.com

PhoneNumber: 9865321477

Register Update Delete Show



**Operation completed successfully!**

#### Show operation

http://localhost:8084/ServletDBDemo/user

localhost:8084/ServletDBDemo/user

Name	Password	Email	Phone No.
Kumar	Apple	kumar@gmail.com	9865321477
Ganesh	mango	ganesh@yahoo.co.in	9943612499

## Update operation

User Details X +

localhost:8084/ServletDBDemo/

UserName

Ganesh

Password

●●●●●●●●

Email

ganesh@gmail.com

PhoneNumber

9943612499

Register

Update

Delete

Show

## After update

http://localho...letDBDemo/user X +

localhost:8084/ServletDBDemo/user

Name	Password	Email	Phone No.
Kumar	Apple	kumar@gmail.com	9865321477
Ganesh	kcejava123	ganesh@gmail.com	9943612499

## Delete operation

User Details X +

localhost:8084/ServletDBDemo/

UserName

Ganesh

Password

●●●●●●●●

Email

ganesh@gmail.com

PhoneNumber

9943612499

Register

Update

Delete

Show

## After delete

http://localho...letDBDemo/user X +

localhost:8084/ServletDBDemo/user

Name	Password	Email	Phone No.
Kumar	Apple	kumar@gmail.com	9865321477